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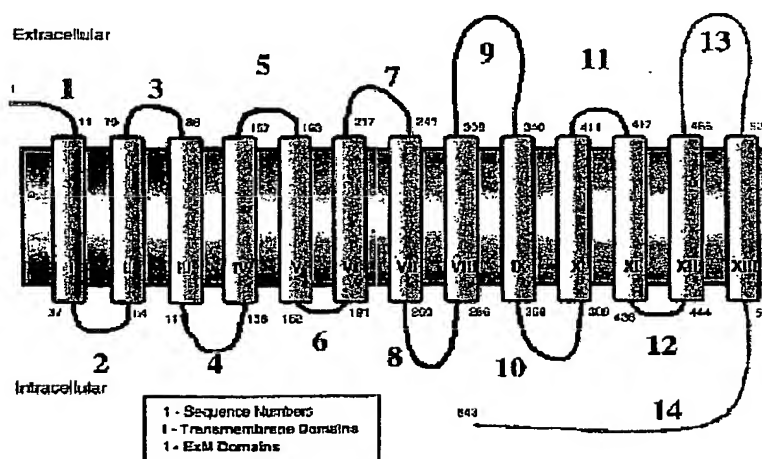
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(54) Title: MODIFIED SODIUM IODIDE SYMPORTER PROTEINS AND GENES FOR IMAGING AND CANCER THERAPY

## Human Sodium/Iodide Symporter



(57) Abstract: The invention provides modified sodium iodide symporter (NIS) proteins, and polynucleotides encoding modified NIS proteins. The modified NIS proteins have a net electrostatic charge more positive than that of corresponding wild-type NIS proteins. Expression of a modified NIS protein in a cell results in higher intracellular concentrations of NIS substrates as compared to equivalent expression of the corresponding wild-type NIS protein in a cell. The invention also provides methods for imaging cells or for therapy of cancer cells, using the modified NIS proteins to facilitate transport of NIS substrates into cells in the body of an individual. Uptake of NIS substrates suitable for either imaging or that have cytotoxic activity, into the cells of the individual that express modified NIS protein facilitate detection of the substrate (for imaging) or killing of the cancer cells (for therapy).